

**HUGHLEECHIA GIULIANII, A NEW GENUS AND NEW SPECIES
OF INTERTIDAL BEETLE FROM AUSTRALIA
(COLEOPTERA: HYDRAENIDAE)**

PHILIP D. PERKINS

% Department of Entomology, Smithsonian Institution,
Washington, D.C. 20560

As part of ongoing studies of the Hydraenidae of Australasia, I have received specimens from the Commonwealth Scientific and Industrial Research Organization (Canberra) and the Western Australian Museum (Perth) which represent an interesting new genus and new species of flightless, intertidal hydraenid, which is herein described as *Hughleechia giulianii*. All specimens were collected by Derham D. Giuliani along the south and west coasts of Australia. Mr. Giuliani comments thusly (in litt.) concerning the habitats of these beetles: "They occurred in rock crevices covered by high tides, dry rock crevices in the high tide splash zone, and usually most numerous in rock pools a few feet above the water line (created by splash and spray but seldom or never reached by waves). In this latter case they were found walking around the edge of the pools on the rock just below the surface, never more than an inch down, often including apparently mating pairs." Some were collected near Albany, "in rock pools on cliffs up to at least 50 feet above the high tide level. Whether these pools were created by seeps or rain or storm-driven spray I do not know."

Two other genera of flightless Hydraenidae are specially adapted for coastal or intertidal existence, *Meropathus* Enderlein and *Neochthebius* d'Orchymont, both of which are members of the subfamily Ochthebiinae Perkins (1980). *Neochthebius* includes two species, one inhabits the pacific coast of North America, the other lives in Japan (Satô, 1963; Perkins, 1980). These two species are truly intertidal, living in rock crevices below high tide line. Eight species are currently included in *Meropathus*: one on the subantarctic islands of Prince Edward, Kerguelen and Heard (Enderlein, 1901; d'Orchymont, 1938; Jeannel, 1940; Janssens, 1967), three on islands of the New Zealand subregion (Ordish, 1971), three inland species in eastern Australia (Janssens, 1967), and one species on the Falkland Islands and Isla de los Estados at the southern end of South America (Perkins, 1980). *Meropathus* species are terrestrial or semi-aquatic, the insular species being found in bird nests and among stones and grass tussocks in coastal areas (Ordish, 1971).

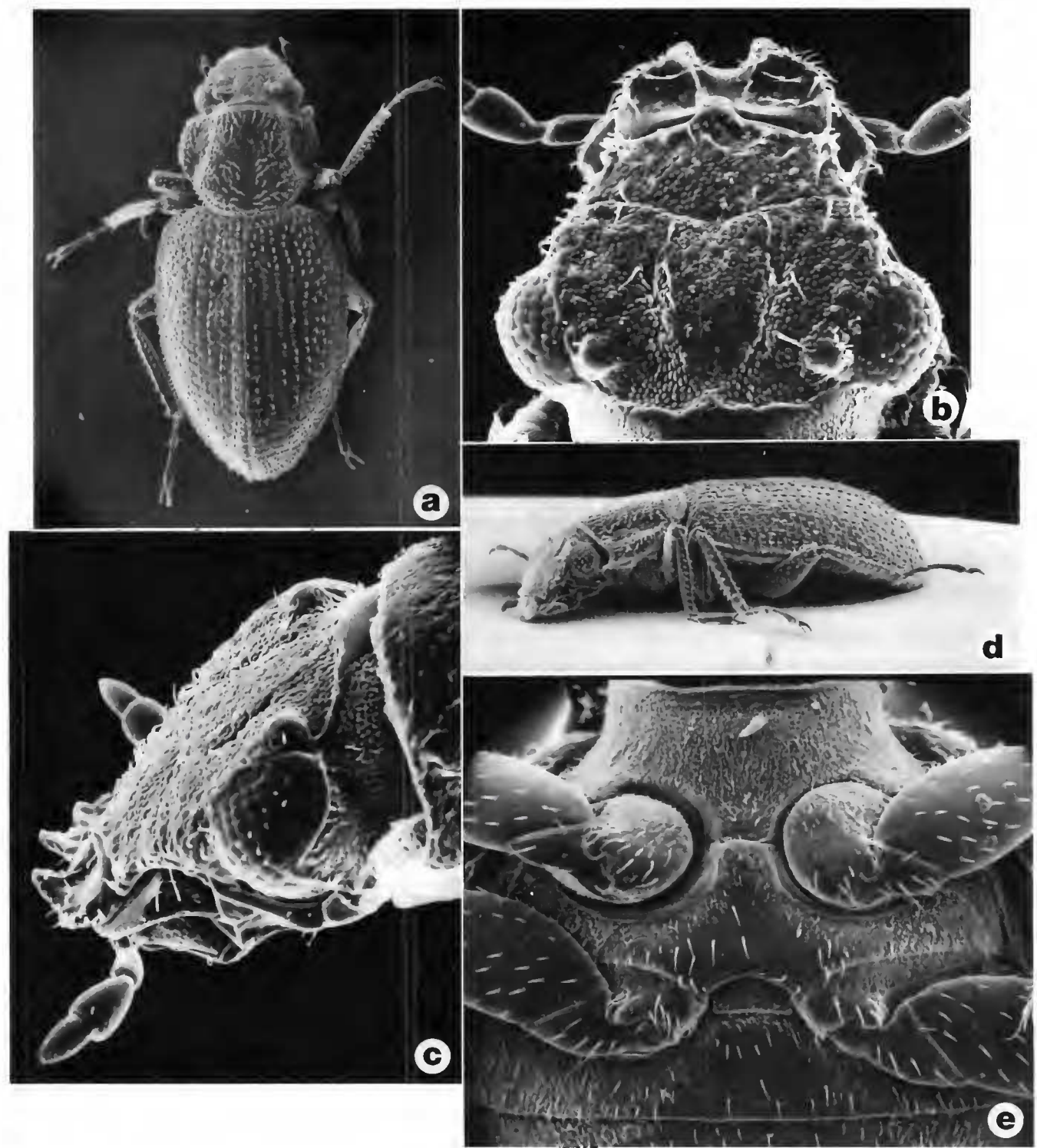


Fig. 1. *Hughleechia giulianii* n. g., n. sp.: (a) dorsal view, 45×; (b) head, male, dorsal view, 185×; (c) head, male, oblique view, 175×; (d) lateral view, 45×; (e) meso- and meta-sternum, 140×.

Phylogenetic relationships of **Hughleechia**

In addition to similarities in habitat, the phylogenetic relationship of this new genus to *Meropathus* and *Neochthebius* is clearly indicated by the fused elytra, reduced metasternum, body form, antennal configuration and by the short, stiff recumbent elytral setae. It is immediately differentiated from *Meropathus* and *Neochthebius* by the widely spaced meso- and me-

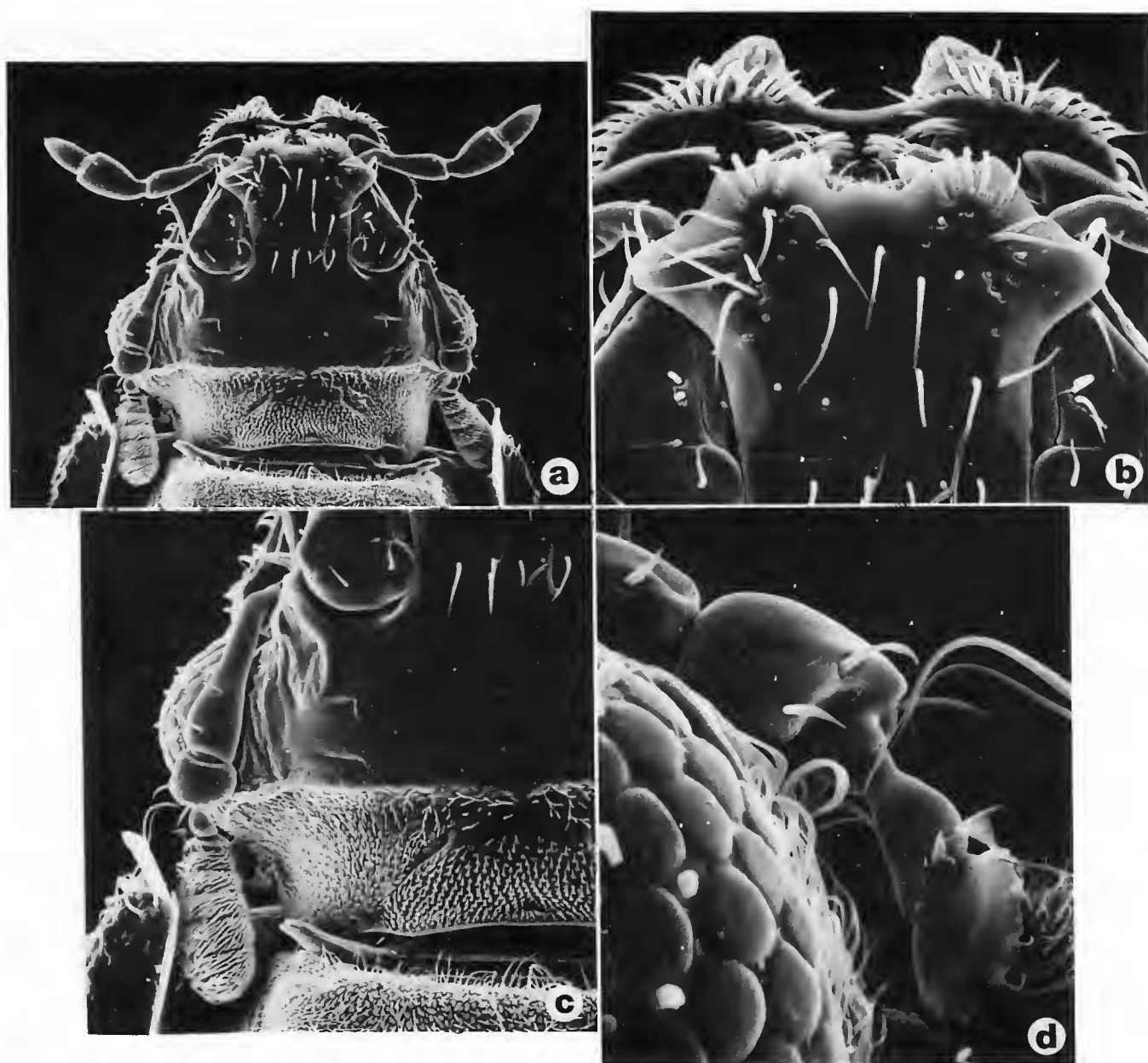


Fig. 2. *Hughleechia giulianii* n. g., n. sp.: (a) head, ventral aspect, 150 $\times$; (b) mentum, 400 $\times$; (c) antenna, 250 $\times$; (d) basal antennal segments, 950 $\times$.

tacoxae (Fig. 1e) and the unusual aedeagus. In *Meropathus* and *Neochthebius* the meso- and metacoxae are nearly contiguous, separated by only a lamina.

In *Meropathus* the aedeagus lacks parameres, whereas *Neochthebius* has fully developed parameres which originate at the base of the main-piece. The aedeagus of *Hughleechia* is a morphocline intermediate, having the parameres originating at mid-length of the main-piece (Fig. 4c). Elsewhere (Perkins, 1980) I have discussed possible mechanisms of paramere loss in the family Hydraenidae, a process which occurs in all major lineages. It appears that *Hughleechia* represents an intermediate stage in paramere loss for the *Neochthebius*-*Hughleechia*-*Meropathus* lineage, and suggests that loss in this lineage is accomplished by fusion of parameres to the main-piece, although it is possible that the location of the parameres is a result

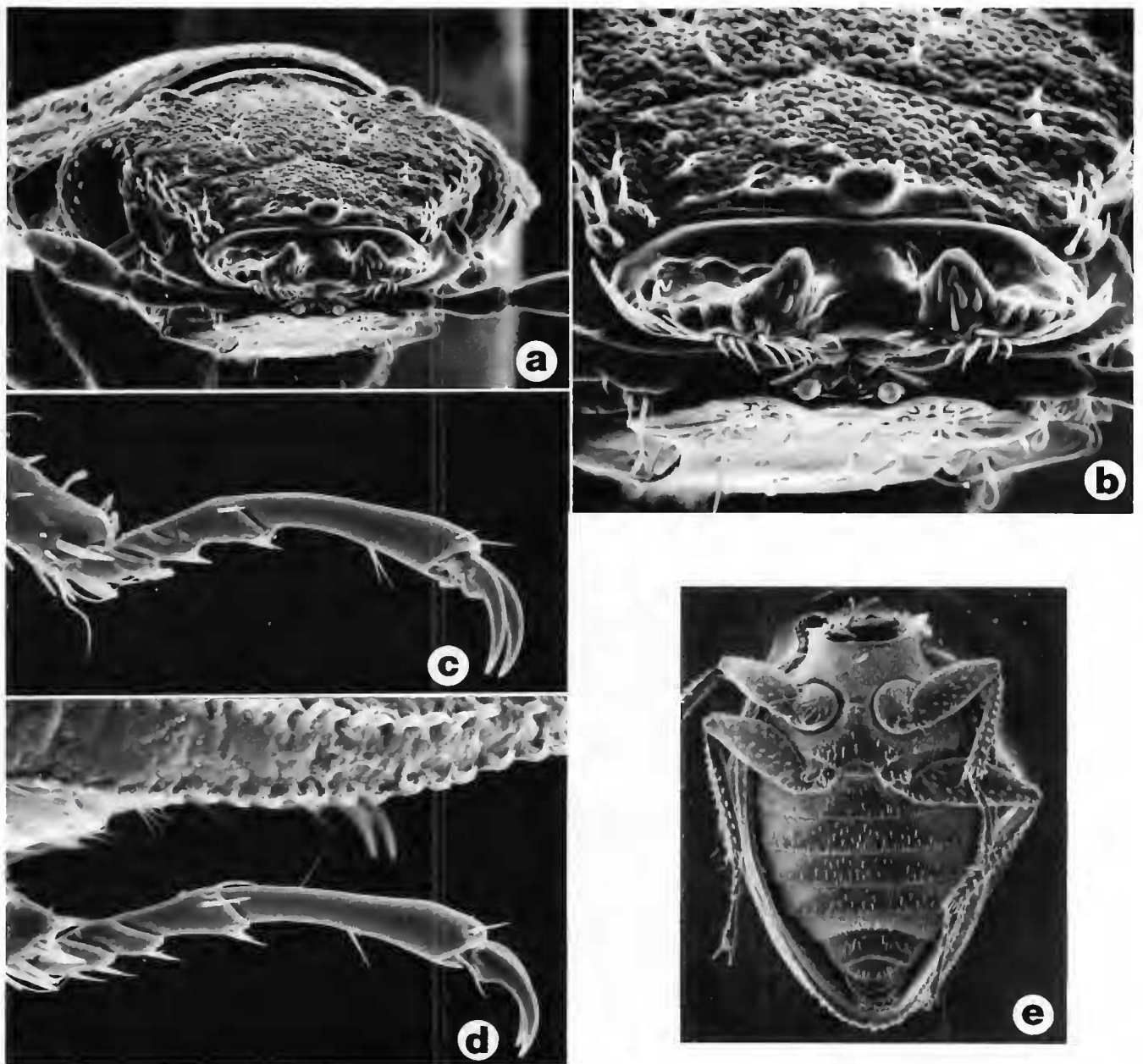


Fig. 3. *Hughleechia giulianii* n. g., n. sp.: (a) head, male, anterior view, 165 $\times$; (b) clypeus and labrum, male, 340 $\times$; (c) mesotarsus, 240 $\times$; (d) metatarsus, 240 $\times$; (e) meso-, metasternum and abdomen, 50 $\times$.

of elongation of the main-piece (for a discussion of terminology and other possible processes in paramere reduction and loss, see Perkins, 1980).

In addition to the widely spaced meso- and metacoxae, *Hughleechia* differs externally from *Meropathus* and *Neochthebius* by lacking hydrofuge pubescence on major portions of the metasternum and abdominal segments (Figs. 1e, 3e), and having more elongate tarsi (Figs. 3c, d). The eyes of *Meropathus* and *Neochthebius* are relatively small and separated from the ocelli. The eyes of *Hughleechia* are larger and the ocelli are adjacent to the eyes (Fig. 1b).

Hughleechia differs further from certain *Meropathus* species by lacking a median sulcus of the metasternum, having elytra devoid of ridges, and

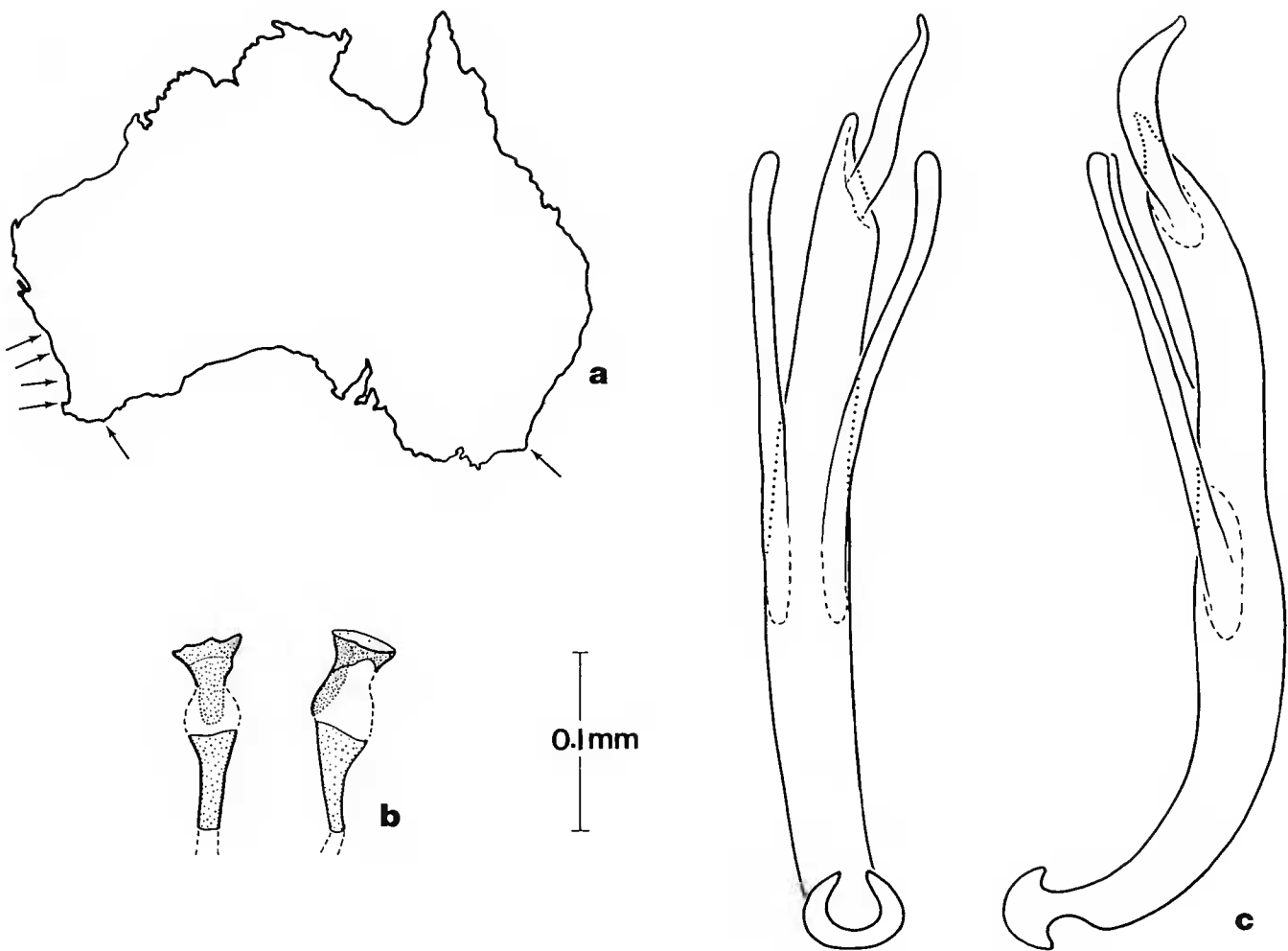


Fig. 4. *Hughleechia giulianii* n. g., n. sp.: (a) known geographical distribution; (b) spermatheca; (c) aedeagus, dorsal and lateral views.

possessing a well developed antennal fossula of the hypomeron. Males of *Hughleechia giulianii* have the labral lobes produced as small, acute, up-turned processes and also have an apicomedian upturned process of the clypeus which is slightly larger than the labral processes (Figs. 1b, c, 3b). Males of some *Meropathus* species have the labral lobes rather remarkably produced, but neither *Meropathus* nor *Neochthebius* males have a clypeal process.

Hughleechia, new genus

Type-species.—*Hughleechia giulianii*, new species.

Gender.—Feminine.

Body form elongate oval, depressed. Head with distinct ocelli next to protuberant eyes; dorsum of head flat, frons and clypeus in same plane. Maxillary palpus short, 4-segmented, segment 1 very small, segment 2 subequal in length to segment 3, segment 3 broader than other segments, segment 4 slightly shorter than segment 3. Antenna (Figs. 2c, d) 9-segmented; 2 basal, 1 small intermediate, 1 small cupule, and 5 pubescent segments

which form a compact club. Pronotum with anterior margin weakly rounded in middle, posterior margin much more strongly rounded; anterior and posterior margins with narrow hyaline border, sides lacking hyaline border; disc with shallow median longitudinal depression which is slightly constricted at midlength; lateral fossulae well developed; pronotal surface with moderately dense and moderately long hairs, except hairs absent in median depression and in lateral fossulae. Elytra ovoid, fused together at suture which is weakly elevated; each elytron with 8 rows of punctures, each puncture with a short, stiff, recumbent seta; rows 6–8 much less distinct than discal rows, sometimes random. Flight wings absent. Hypomeron with well developed fossula. Prosternum slightly and evenly elevated in midline, not carinate; procoxae contiguous. Mesosternum (Fig. 1e) broad between mesocoxae, lacking carinae, with hydrofuge pubescence. Metasternum (Fig. 1e) reduced, length in midline approximately equal to that of mesosternum; intercoxal process broad, equal in size to intercoxal process of mesosternum; metacoxae widely separated; hydrofuge pubescence restricted to lateral areas and narrow band along edge of mesocoxal cavities. Abdomen (Fig. 3e) 7-segmented; intercoxal sclerite broader than long; segments 1–4 with hydrofuge pubescence restricted to sides; segment 5 totally hydrofuge pubescent; segments 6 and 7 with a few sparse hairs. Legs rather long. Tarsi long, slender for most of length, but distinctly broadened apically; tarsal formula 5-5-5; segments 1–3 very small, combined length subequal to length of segment 4; segment 5 slightly longer than other segments combined.

Etymology.—It is with pleasure that I dedicate this new genus to Hugh B. Leech, a small gesture in recognition of his aid to the advancement of Coleopterology in general, and specifically in appreciation for his many and lasting contributions to the knowledge of aquatic beetles.

Hughleechia giulianii, new species

Type-data.—Holotype male and allotype. Western Australia, Fisherman's Island, 28-IV-1969, D. D. Giuliani. Deposited in the Western Australian Museum, Perth.

Paratypes (80 specimens; all collected by D. D. Giuliani).—Western Australia: Little Anchorage, 24-IV-1969. Small island just offshore of Little Anchorage, 25-IV-1969. Fisherman's Island, 28-IV-1969. Beaches and points of Rottnest Island, 3-V-1969. Bald Head, Albany, 10-V-1969. 50 miles S Dongara, 4-IV-1969 (all above in WAM). Peron Point nr. Rockingham, 28-IX-1969. Cape Naturalist (33.32s 115.01e), 30-X-1969 (this and previous in CSIRO). New South Wales: Green Cape, 8-VIII-1968 (WAM).

Description.—Holotype male 1.80 mm long, 0.84 mm wide. Color black dorsally, infrequently with faint metallic blue reflections; venter and legs dark brown.

Head.—Length 0.36 mm, width 0.46 mm. Frons strongly granulose,

sparsely pubescent at sides; interocular foveae oblique impressed lines, area between foveae flat; interocular tuberculi well developed, adjacent to posteromedian margin of eyes, sparsely setose. Frontoclypeal suture very shallowly bisinuate. Clypeus length $\frac{1}{2}$ width, less strongly granulose and hence more reflective than frons, sparsely punctate; apicomedian margin upturned to form a blunt tooth. Labroclypeal suture weakly arcuate. Labrum length $\frac{1}{2}$ width; apicomedian emargination well developed, hemispherical, at each side of which is a distinctive tooth; surface of labrum smooth and shiny. Maxillary palpus with penultimate segment moderately wide; ultimate segment tapering to apex, $\frac{3}{4}$ length of penultimate. Mentum produced at sides (Figs. 2a, b), shiny, very sparsely punctate. Submentum shiny. Genae swollen in midregion, shiny, finely sparsely punctulate. Postgena pubescent, punctulate.

Thorax.—Pronotum length at midline 0.46 mm; maximum width (slightly before midlength) 0.60 mm; sparsely pubescent on reliefs; depressions granulose, reliefs punctate and less strongly granulose, hence more reflective than depressions; anterior margin weakly arcuate, with narrow hyaline border; sides rather strongly convergent from midlength; posterior margin with narrow hyaline border which is overlaid with a row of setae; median depression without setae, slightly constricted in midlength, anterior $\frac{1}{2}$ more strongly granulose than posterior $\frac{1}{2}$; a shallow depression on each side at base which connects to base of median depression, these oblique depressions with pubescence like that on reliefs; lateral fossulae well developed. Prosternum evenly rounded in midregion, antennal fossulae well developed; coxae contiguous. Mesosternum pubescent, with broad intercoxal process whose width at apex is about equal to length of last segment of maxillary palpus; carinae totally lacking, not even with remnants anteriorly. Metasternum hydrofuge pubescent except for shiny triangular area in midregion which has only a few setae; intercoxal process broad, about equal in length and width to mesosternal intercoxal process, but with apex on a plane slightly higher than that of latter; posteromedian area between metacoxae broadly emarginate to receive intercoxal sclerite.

Elytra.—Length 1.08 mm; maximum width (near midlength) 0.84 mm. Wings absent, elytra interlocked. Each elytron with 5 distinct discal rows of punctures, and 3 semi-serial rows laterally, each puncture with a short, stiff recumbent seta, some punctures confluent in basal $\frac{1}{5}$; suture very slightly raised. Explanate margin moderately developed. Elytron distinctly declivous in apical $\frac{1}{4}$.

Abdomen.—Intercoxal sclerite broader than long. Sterna 1–4 hydrofuge pubescent laterally; shiny, non-hydrofuge pubescent median area of sternum 1 forming equilateral triangle, similar areas of sterna 2–4 forming broad triangles (Figs. 1e, 3e). Hydrofuge pubescence completely covering sternum 5, absent from sterna 6 and 7, the latter two with sparse hairs.

Legs.—All legs moderately long and slender. Tarsi broadened apically,

claws large. Segment 5 (last) of all tarsi longer than respective basal segments combined. Segment 4 of meso- and metatarsi equal to combined lengths of segments 1–3. Protarsi with segment 4 slightly shorter than combined lengths of segments 1–3.

Genitalia.—Aedeagus with parameres originating near midlength of main-piece (Fig. 4c). Spermatheca as illustrated (Fig. 4b).

Variation.—Females average slightly larger than males, some individuals attaining 2.00 mm in length. Females lack clypeal and labral processes seen in males.

Distribution.—Currently known from the south and west coasts of Australia (Fig. 4a).

Etymology.—I am pleased to dedicate this new species to Derham D. Giuliani, who collected all known specimens.

Acknowledgments

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